MICHIGAN - U.P.

FOREST PEST MANAGEMENT REPORT
REGION I
January 1985

Following is a brief review of 1984 pest conditions which may be of concern to Region I Forest Land Managers in 1985.

Spruce Budworm. Spruce budworm injury to spruce and fir was very evident for the second year in a row since its temporary collapse in 1981-82. The following table presents the acres of defoliation by county and degree of damage.

	[1]Light	Moderate	Heavy
Alger	1,570	3,280	2,780
Baraga	1,000	5,000	840
W. Chippewa	--	540	--
Delta	2,500	7,430	6,398
Dickinson	7,020	16,000	11,176
Houghton	2,340	1,480	80
Iron	4,000	15,290	1,553
Keweenaw	1,160	440	--
Luce	1,644	2,430	2,010
W. Mackinac	340	2,440	--
Marquette	4,480	12,000	37,050
Menominee	4,360	8,310	3,720
Schoolcraft	2,140	5,510	3,660
TOTALS	32,554	80,150	69,267

TOTAL ACRES DEFOLIATED = 181,974

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[1]Light defoliation - Light brown cast to trees; less than 50% loss of current needles.
Moderate defoliation - Tree tops with darker brown cast than lower canopy; more than 50% loss of current year's needles.
Heavy defoliation - Deep brown cast over entire tree; 100% loss of current year's needles with some back feeding.

We are currently evaluating the economics of protecting valuable fir and spruce/fir stands in District 3 and Dickinson County. Protection would involve spraying marketable stands which would lose a significant cord wood volume if not protected, and which cannot be harvested in time to salvage projected losses.

We sprayed West Branch Campground in Dickinson County with Thuricide (a biological insecticide) in early June, 1984, to protect the remaining spruce and fir. Without these trees, the campground would have little remaining forest cover.

Jack Pine Budworm. Jack pine budworm defoliation of jack pine was detected north of Seney in Schoolcraft County in 1983. Fifty acres of heavy defoliation

and 120 acres of moderate defoliation was mapped on state land. To the east in Chippewa County approximately 1,600 acres of budworm damage was detected on the Hiawatha National Forest. In 1984, we detected 3,200 acres of heavy, 3,460 acres of moderate, and 560 acres of light defoliation all in Schoolcraft County. The Hiawatha National Forest recorded 15,590 acres of damage. This epidemic is expected to expand rapidly for the next 2-4 years affecting most jack pine areas in the U.P.

Jack pine sawfly populations were also detected in Schoolcraft County near a budworm area. Although the sawfly is not a serious pest by itself, in combination with jack pine budworm it can be disastrous. We must watch closely for this combination of pests.

White Grubs. White grub population numbers were high in 1984. Many reports of grub injury were received from areas throughout the U.P. Seedling mortality was the primary injury reported. Grub injury is not usually diagnosed unless seedlings are killed. I detected grub induced growth loss many times last year in new to 2 year-old plantations with little seedling mortality. Both red and jack pine were affected. Grub injury to seedlings planted on old field sites or conversion areas which had a large portion of opening is a greatly underestimated problem.

I am currently trying to channel our needs for (the development of) a grub suppression chemical to cooperating agencies and pesticide manufacturers.

Red-Headed Pine Sawfly. Several small epicenters of red-headed pine sawfly were detected in Luce and Mackinac Counties this year. Severe defoliation of several of these small pockets resulted. Sawfly numbers are expected to increase in 1985. Areas with sawfly defoliation in 1984 should be watched closely in 1985.

Orange-Humped Maple Worm. This was the second year of large-scale defoliation of sugar maple by the orange-humped maple worm. Approximately 8,500 acres were heavily defoliated (90% or more leaf loss) in Chippewa and Mackinac Counties with an area of approximately 6000 acres denuded around McNearney Lake in Chippewa County. An additional 3400 acres of light to moderate defoliation was detected off the LAKE MICHIGAN shoreline southwest of Gould City in Mackinac County. Population levels are not expected to diminish for at least another year.

Bruce Spanworm-Fall Cankerworm (Loopers). Iron County had several hardwood areas defoliated to varying degrees by a Bruce spanworm-fall cankerworm complex. These greenish hairless loopers feed from mid to late May through mid June. Favored host trees include sugar maple, aspen and beech. Defoliation comparable or greater than that seen in 1984 is expected in 1985. Epidemics generally last 2 years.

Gypsy Moth. Although we continue detecting moths via the Michigan Department of Agriculture trapping programs with pheromones, catches are primarily single moth collections. This seldom results in follow-up detection of established populations. Our first multiple catch of 6 moths in 1983 near Powers and

Spalding was successfully eradicated. The 400 acre parcel was sprayed in the Spring, 1984. No moths were collected from the area after spraying.

The lower peninsula is now considered generally infested. Thus, the opportunity for hitch-hiking insects to enter the U.P. does exist. However, an intensive detection program followed by chemical suppression of detected populations appears to be an effective method for keeping the U.P. gypsy moth free for many years.

Oak Wilt. The oak wilt control effort in the Shakey Lakes Area of Menominee County progressed another step this summer. Last year's herbicide treatment to create dead-tree barriers to root graft transmission were unsuccessful. The herbicides did not kill the trees below the girdling. We are not satisfied that root graft transmission of oak wilt will not occur through these living root systems. In view of this, we began creating mechanical root graft barriers with a vibratory plow (48" blade) this summer. Eighteen of the 27 detected epicenters were treated. Two lines were plowed around half of the treated epicenters and half had single lines. Double line treatments included an interior line placed one apparently healthy tree outside wilting trees, and an exterior line 2 healthy trees outside the wilting epicenter. The interior line, if successful, will minimize tree loss due to its close placement. The closer the line to the disease front, the better the chance that all potentially diseased trees within the perimeter will die before they can re-establish root grafts across the plow line. The exterior line is an insurance line in case the first row of apparently healthy trees include diseased trees without symptom development this year. Funding constraints dictated that several epicenters receive only one line, thus allowing more epicenters to be treated. This is not all bad. We would like to obtain a 60" plow blade for next year's treatments. This has a much better success record in disrupting all potential root graft barriers. The 9 remaining untreated epicenters and any escapes from this year's control lines will be treated next year - hopefully with a 60" blade.

A positive effect of last year's herbicide treatments was the prevention of pressure pad development on most herbicided wilting trees. Apparently the trees died quickly and dried enough before winter to prevent pressure pad development. Thus, random transmission by sap beetles was greatly reduced. Because of this, this year's wilting trees were herbicided in the fall.

We hope to mount a full scale program against oak wilt for the next 2-3 years. We plan to contract complete aerial photo coverage of the area next July to insure all epicenters are detected. Michigan Technological University, the Michigan Department of Agriculture, the M.S.U. Cooperative Extension Service and the Michigan Department of Natural Resources are cooperating to control the oak wilt. We feel we have an excellent opportunity to eliminate oak wilt from this valuable oak resource.

PROJECTS

Mycorrhizae Research - M.T.U., Dr. Johann Bruhn. Significant advances were realized in 1984 in the study of potentially beneficial mycorrhizal fungi

native to the U.P. A fungi (Scleroderma aurantium) collected in association with red pine in the Danaher Plains was isolated in pure culture. The innoculum successfully promoted mycorrhizal structures on pine seedling roots in the green house. These mycorrhizal structures appear to be distinctive, so we can identify them in the field without relying on the presence of fruiting structures (eg. mushrooms, or in this case a puffball). Other fungi have also been collected both on jack pine and red pine. Scleroderma looks especially promising because of its potentially wide host range (jack and red pine, and perhaps larches), and its presence on many diverse sites throughout the U.P.

A recent boost to this program has been Mead Corporation's involvement in mycorrhizae research. They have funded Dr. Johann Bruhn at M.T.U. to study and develop innoculation procedures in their green house operations using native mycorrhizal fungi. Dr. Bruhn will evaluate seedling response as correlated to presence of mycorrhizal associations resulting from green house innoculation. Scleroderma aurantium will initially be tested on red and jack pine containerized stock.

As part of an ongoing project entitled the Shingleton Reforestation Trials, we will plant red and jack pine seedlings in the Kingston Plains NE of Kingston Lake in the fall, 1985. Innoculated and uninnoculated containerized red and jack pine will be planted in areas which have and have not had the heavy lichen matts reduced via a prescribed burn in 1984. Lichen presence is suspected to inhibit mycorrhizal associations and lichens are moisture demanding plants.

Division Pesticide Policy. A Forest Management Division policy governing the use and storage of pesticides has recently been approved. As part of this policy, a pesticide application plan will be required which records the essential criteria for making a pesticide prescription. After a pesticide application is completed, a pesticide use evaluation report will be required which will document the results of the application. For herbicides, the use-evaluations are completed in the second year after treatment. District Silvaculturalists will play a major role in these evaluations.

As forest Management efforts intensify, we need increasingly to weigh the costs and benefits of forest management options. Thus, it is important that we closely evaluate - via record keeping - the results of our pesticide applications.

Personal Computer at Region (IBM-PC). We now have a personal computer at Marquette. This system will be upgraded in the next 2-3 months so we have a fully functional system by May. Currently we lack a printer, a second disk drive and a modum for connecting with computers by phone line.

I am currently trying to obtain a special output from Operations Inventory on disk so the IBM-PC can be used to quickly sort and evaluate the large amount of information involved. This request is for stand information from four Forest Areas relating to the Spruce budworm protection program mentioned earlier in this report.

RLH:jlk

Bob Heyd